

Digital Feedback

Status Report

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Overview

- Status of digital feedback when transferred
- Work done since then
- Present performance
- Comparison of analog and digital feedback systems
- Remaining issues

Status of Digital Feedback when transferred

- Ported to Power PC
- Fast buffer only diagnostic
- Orbit jump when turned on
- Single pole servo filter
- Run overnight w/ occasional beam dumps
- Trim upgrade canceled

Work done

- Fast trims added back legs deleted
- Added diagnostics
 - DACs and ADCs accessible through pretune
 - Labview program to test ADCs and DACs
 - Found bad DAC board

Work done

- Baseline orbit read from digital feedback ADCs rather than from the orbit micro
- Response matrix measuring program
- Many studies performed

Studies

- Compared performance of digital feedback with analog feedback
- Large jumps with analog and digital
- 3 pole filter has very narrow lock range
 - unusable
- 1 pole filter has adequate lock range
- Lock range improves w/ reduced gain

Studies

- Noted that several trims enter voltage saturation with high gain settings and with 3 pole filter
- Currently using a 1 pole filter for horizontal feedback
 - Pole at 0.015Hz

Analog feedback

- Slightly better performance
 - Take advantage of fast local trims
- Very complicated
- Global and local
- Decoupling
- 8Hr to determine decoupling coefficients for 1 local feedback area
- Many micros

Analog feedback

- Measurement of local feedback response matrix is partially automated
- Measurement of the decoupling coefficients is partially automated
- Major project to update system for a new lattice
- Maintenance nightmare
 - Obsolete components

Digital feedback

- Limited by the slowest trim in the system
- Slightly lower performance than analog global and local feedbacks combined
- Can be updated for a new lattice in a few minutes
 - Measure response matrix
- 1 micro

Digital feedback

- Simple maintenance

Remaining Issues

- Code frozen until orbit stability issues are resolved
 - Monitoring X-5 magnets
- Time base bug in fast buffer
- Pipe motion data
- Trim power supply upgrade
 - Double bandwidth of feedback
- Limited programming resources
 - Long lead time for any changes